

## **CLAIMS**

### **We Claim:**

1. An apparatus to provide power to a plurality of light emitting diodes for producing a desired color and brightness, the apparatus comprising:
  - an inductor coupled in series with a first light emitting diode;
  - a second light emitting diode coupled in parallel to the inductor and the first light emitting diode such that the second light emitting diode is reverse biased when a power source drives a current through the inductor and the first light emitting diode; and
  - a switch controlling the connection of the inductor and the first light emitting diode to the power source.
2. The apparatus recited in claim 1 further comprising: a third light emitting diode coupled, in parallel to the first light emitting diode, to a first terminal and a second terminal of the power source.
3. The apparatus recited in claim 1 further comprising: a third light emitting diode coupled, in series to the first light emitting diode, to a first terminal and a second terminal of the power source.
4. An apparatus to provide power to drive a plurality of light emitting diodes comprising: an inductor coupled in series with a first light emitting diode, a switch controlling a connection of the inductor and the first light emitting diode to a power source; and a first terminal and a second terminal of the power source connected in series to the inductor via the switch and at least one second light emitting diode, the at least one second light emitting diode having a forward voltage higher than input voltage across the first and second terminals, wherein furthermore, the second light emitting diode is connected in parallel to the switch and the first light emitting diode, wherein furthermore, the second light emitting diode is coupled in series with the inductor and the power source.

5. The apparatus recited in claim 4 further comprising: a third light emitting diode coupled in parallel to the first and second input terminals.
6. The apparatus recited in claim 4 further comprising: a third light emitting diode coupled in series with the first or second terminals.
7. An apparatus to provide power to drive a plurality of light emitting diodes comprising: a switching forward power converter with a transformer; a secondary winding coupled to the transformer having at least two terminals; a first light emitting diode having a first end and a second end, the first end of the first light emitting diode coupled to a first terminal of the secondary winding and the second end of the first light emitting diode coupled to a first end of an inductor and a first end of a second light emitting diode, wherein furthermore, a second end of the second light emitting diode being coupled to a second terminal of the secondary winding; and a third light emitting diode coupled in parallel with the series combination of the second light emitting diode and the inductor.
8. An apparatus to provide power to drive a plurality of light emitting diodes comprising: a switching flyback power converter with a transformer; a plurality of secondary windings coupled to the transformer; and at least one light emitting diode coupled to each of two of the plurality of secondary windings.
9. The apparatus recited in claim 8 further comprising: a bridge rectifier for converting an alternating current to a direct current; and means to operate the flyback converter to operate in discontinuous mode with current delivered by an alternating current source with phase angle following a corresponding alternating voltage.
10. An apparatus to provide power to drive a plurality of light emitting diodes comprising:
  - a switching bridge power converter with a transformer;
  - a plurality of secondary windings including at least a first secondary winding and a second secondary winding coupled to the transformer such that

a first terminal of the first secondary winding has the opposite polarity to that of a first terminal of the second secondary winding;

a first and a second light emitting diode coupled together at their cathodes, wherein furthermore, an anode of the first light emitting diode being connected to the first terminal of the first secondary winding and an anode of the second light emitting diode being connected to the first terminal of the second secondary winding; and

an inductor coupled to the cathodes of the first and the second light emitting diodes, the inductor further coupled to a second terminal of the first secondary winding and a second terminal of the second secondary winding via a third light emitting diode.